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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,897	03/04/2004	Takahiko Kawatani	1509-477	4562

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HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
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PHAM, MICHAEL

ART UNIT	PAPER NUMBER
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2167

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/06/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No. 10/791,897	Applicant(s) KAWATANI, TAKAHIKO	
	Examiner Michael D. Pham	Art Unit 2167	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6,8 and 13-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8 and 13-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**Detailed Action**

**Priority.**

1. Should applicant desire to obtain the benefit of foreign priority under 35 U.S.C. 119(a)-(d) prior to declaration of an interference, a certified English translation of the foreign application must be submitted in reply to this action. 37 CFR 41.154(b) and 41.202(e).

Failure to provide a certified translation may result in no benefit being accorded for the non-English application.

***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1, 13, and 29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

**a) "USEFUL RESULT"**

For an invention to be "useful" it must satisfy the utility requirement of section 101. The USPTO's official interpretation of the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial and (iii) credible. MPEP § 2107 and *Fisher*, 421 F.3d at 1372, 76 USPQ2d at 1230 (citing the Utility Guidelines with approval for interpretation of "specific" and "substantial"). In addition, when the examiner has reason to believe that the claim is not for a practical application that produces a useful result, the claim should be rejected, thus requiring the applicant to distinguish the claim from the three 35 U.S.C. 101 judicial exceptions to patentable subject matter by specifically reciting in the claim the practical application. In such cases, statements in the specification describing a practical application may not be sufficient to satisfy the requirements for section 101 with respect to the claimed invention. Likewise, a claim that can be read so

**broadly as to include statutory and nonstatutory subject matter must be amended to limit the claim to a practical application. In other words, if the specification discloses a practical application of a section 101 judicial exception, but the claim is broader than the disclosure such that it does not require a practical application, then the claim must be rejected.**

4. Claims 1, 13, and 29 do not provide a useful, concrete, and tangible result that is used to implement the method so as to realize its functionality. Thus, claims 1, 13, and 29 are merely an abstract idea and are being processed without links to a practical result in the technological arts and without a practical application.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

6. A person shall be entitled to a patent unless –

7. Claims 1-6, 8, 13, 14-29 rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication 2004/0093557 by Takahiko Kawatani.

8. The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C.

102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

**Claim 1:**

Willies discloses the following claimed limitations:

“(a) obtaining a document (or pattern) frequency matrix for the set of input documents (or patterns), based on occurrence frequencies of terms appearing in each document (or pattern)” as co-occurrence matrix (0029);

“(b) selecting a seed document (or pattern) from remaining documents (or patterns) that are not included in any cluster existing at that moment and constructing a current cluster of the initial state using the seed document (or pattern);” as individual documents are set as the seeds of clusters as an initial state (0011)

“(c) obtaining the document (or pattern) commonality to the current cluster for each document (or pattern) in the input document (or pattern) set by using information based on the document (or pattern) frequency matrix for the input document (or pattern) set, information based on the document (or pattern) frequency matrix for documents (or patterns) in the current cluster and information based on the common co-occurrence matrix of the current cluster, and making documents (or patterns) having the document commonality higher than a threshold belong temporarily to the current cluster;” as co-occurrence matrix, common co-occurrence matrix, and threshold (0044, and figure 4)

“(d) repeating step (c) until the number of documents (or patterns) temporarily belonging to the current cluster becomes the same as that in the previous repetition;” as decrements mismatch allowance threshold and starts again (figure 4 element 52)

“(e) repeating steps (b) through (d) until a given convergence condition is satisfied; and”  
calculates and continually decrements until the commonality is greater than the threshold (0044)

“(f) deciding, on the basis of the document (or pattern) commonality of each document (or pattern) to each cluster, a cluster to which each document (or pattern) belongs. “(abstract commonality of documents)

**Claim 2:**

Kawatani discloses

“(a-1) generating a document (or pattern) segment vector for each of said document (or pattern) segments based on occurrence frequencies of terms appearing in each document (or pattern) segment; “ (0044)

“(a-2) obtaining a co-occurrence matrix for each document (or pattern) in the input document (or pattern) set from the document (or pattern) segment vectors; and” (0044)

“(a-3) obtaining a document (or pattern) frequency matrix from the co-occurrence matrix for each document” (0044)

**Claim 3:**

Kawatani discloses

“(b-1) constructing a common co-occurrence matrix of remaining documents (or patterns) that are not included in any cluster existing at that moment; and “(0044, co-occurrence matrix)

“(b-2) obtaining a document commonality to the set of the remaining document (or pattern) set for each document (or pattern) in the remaining document (or pattern) set by using

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the common co-occurrence matrix of the remaining documents (or patterns), and extracting the document (or pattern) having the highest document (or pattern) commonality, and constructing a current cluster of the initial state by making a document (or pattern) set including the seed document (or pattern) and the neighbor documents (or patterns) similar to the seed document (or pattern). “ (0044)

**Claim 4:**

Kawatani

“(c-1) constructing a common co-occurrence matrix of the current cluster and a document (or pattern) frequency matrix of the current cluster;” (element 36 figure 4)

“(c-2) obtaining the distinctiveness of each term and each term pair to the current cluster by comparing the document (or pattern) frequency matrix of the input document (or pattern) set and the document (or pattern) frequency matrix of the current cluster;” (element 47 figure 4, calculation of mismatch allowance) and”

“(c-3) obtaining document (or pattern) commonalities to the current cluster for each document (or pattern) in the input document (or pattern) set by using the common co-occurrence matrix of the current cluster and weights of each term and term pair obtained from their distinctiveness, and making a document (or pattern) having the document (or pattern) commonality higher than a threshold belong temporarily to the current cluster. (0049, measures threshold of document set commonality) “

**Claim 5:**

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A clustering method according to claim 1, further including,

repeating step (e) until the number of documents (or patterns) whose document (or pattern) commonalities to any current clusters are less than a threshold becomes 0, or the number is less than a threshold and is equal to that of the previous repetition. (figure 4, repeats if less than threshold)

**Claim 6:**

A clustering method according to claim 1, wherein step (f) further includes, checking existence of a redundant cluster, and removing, when the redundant cluster exists, the redundant cluster and again deciding the cluster to which each document belongs. (figure 4)

**Claim 8:**

A method according to claim 1, wherein each component of the document (or pattern) frequency matrix of a document (or pattern) set D is the number of documents (or patterns) in which a corresponding component of the co-occurrence matrix of each document (or pattern) in the document (or pattern) set D does not take a value of zero. A document set D, assumes a value different from zero (0045)

**Claim 9:**

A method according to claim 1 further comprising determining the common co-occurrence matrix of a document (or pattern) set D from a matrix  $T_{sup.A}$  on the basis of a matrix T whose  $mn$  component is determined by the matrix  $T_{sup.A}$  having an  $mn$  component determined by



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$T_{sup.A.sub.mn} = T_{sub.mn}$ ,  $U_{sub.mn} > A$ ,  $T_{sup.A.sub.mn} = 0$  otherwise, where  $U_{sub.mn}$  represents the  $mn$  component of the document (or pattern) frequency matrix of the document (or pattern) set  $D$ .

**Claim 13:**

Kawatani discloses

“(a) obtaining a document (or pattern) commonality to the remaining document (or pattern) set for each document (or pattern) in the remaining document (or pattern) set by using the said common co-occurrence matrix of the remaining documents (or patterns)”, as co-occurrence matrix (0029);

“(b) extracting, as candidates of the seed of the current cluster, a specific number of documents (or patterns) whose document (or pattern) commonalities obtained by step (a) are large;” as individual documents are set as the seeds of clusters as an initial state (0011)

“(c) obtaining similarities of the respective candidates of the seed of the cluster to all documents (or patterns) in the input document (or pattern) set or in the remaining document (or pattern) set, and obtaining documents (or patterns) having similarities larger than a threshold as neighbor documents (or patterns) of the candidate; and” as co-occurrence matrix, common co-occurrence matrix, and threshold (0044, and figure 4)

“(d) selecting the candidate whose number of the neighbor documents (or patterns) is the largest among the candidates as the seed of the current cluster and making its neighbor documents (or patterns) the current cluster of the initial state. “as decrements mismatch allowance threshold and starts again (figure 4 element 52) .

**Claim 14:**

A method according to claim 1 further including detecting the distinctiveness of each term (or object feature) and each term pair with respect to the current cluster and detecting their weights, the distinctiveness and weight detecting steps including

“(a) obtaining a ratio of each component of a document (or pattern) frequency matrix obtained from the input document (or pattern) set to a corresponding component of a document (or pattern) frequency matrix obtained from the current cluster as a document (or pattern) frequency ratio of each term (or feature) or each term (or feature) pair;” as co-occurrence matrix (0029);

“(b) selecting a specific number of terms (or features) or term (or feature) pairs having the smallest document (or pattern) frequency ratios among a specific number of terms (or features) or term (or feature) pairs having the highest document (or pattern) frequencies, and obtaining the average of the document (or pattern) frequency ratios of the selected terms (or features) or term

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(or feature) pairs as the average document (or pattern) frequency ratio; “as individual documents are set as the seeds of clusters as an initial state (0011)

“(c) dividing the average document (or pattern) frequency ratio by the document (or pattern) frequency ratio of each term (or feature) or each term (or feature) pair as a measure of the distinctiveness of each term (or feature) or each term (or feature) pair; and” as co-occurrence matrix, common co-occurrence matrix, and threshold (0044, and figure 4)

“(d) determining the weight of each term (or feature) or each term (or feature) pair from a function having the distinctiveness measure as a variable. “as decrements mismatch allowance threshold and starts again (figure 4 element 52) .

**Claim 15:**

A method according to claim 1 further including eliminating terms (or features) and term (or feature) pairs having document (or pattern) frequencies higher than a threshold. (figure 4, element 49 threshold)

**Claim 16:**

A method according to claim 1 wherein clustering is performed recursively by letting the document (or pattern) set included in a cluster be the input document (or pattern) set (figure 4

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lement 52).

**Claim 17:**

A computer program product for causing a computer to perform the method of claim 1 [0044, general purpose computer].

**Claim 18:**

A computer program product for causing a computer to perform the method of claim 2[0044, general purpose computer].

**Claim 19:**

A computer program product for causing a computer to perform the method of claim 3[0044, general purpose computer].

**Claim 20:**

A computer program product for causing a computer to perform the method of claim 4[0044, general purpose computer].

**Claim 21:**

A computer program product for causing a computer to perform the method of claim 5[0044, general purpose computer].

**Claim 22:**

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A computer program product for causing a computer to perform the method of claim 6[0044, general purpose computer].

**Claim 23:**

A computer arranged to perform the method of claim 1[0044, general purpose computer].

**Claim 24:**

A computer arranged to perform the method of claim 2[0044, general purpose computer].

**Claim 25:**

A computer arranged to perform the method of claim 3[0044, general purpose computer].

**Claim 26:**

A computer arranged to perform the method of claim 4[0044, general purpose computer].

**Claim 27:**

A computer arranged to perform the method of claim 5[0044, general purpose computer].

**Claim 28:**

A computer arranged to perform the method of claim 6[0044, general purpose computer].

**Claim 29:**

Willies discloses the following claimed limitations:

“(a) means for obtaining a document (or pattern) frequency matrix for the set of input documents (or patterns), based on occurrence frequencies of terms appearing in each document (or pattern)” as co-occurrence matrix (0029);

“(b) means for selecting a seed document (or pattern) from remaining documents (or patterns) that are not included in any cluster existing at that moment and constructing a current cluster of the initial state using the seed document (or pattern);” as individual documents are set as the seeds of clusters as an initial state (0011)

“(c) means for obtaining the document (or pattern) commonality to the current cluster for each document (or pattern) in the input document (or pattern) set using information based on the document (or pattern) frequency matrix for the input document (or pattern) set, information based on the document (or pattern) frequency matrix for documents (or patterns) in the current cluster and information based on the common co-occurrence matrix of the current cluster and means for making documents (or patterns) having the document (or pattern) commonality higher than a threshold belong temporarily to the current cluster; “ as co-occurrence matrix, common co-occurrence matrix, and threshold (0044, and figure 4)

“(d) means for repeating the operations of means (c) until the number of documents (or patterns) temporarily belonging to the current cluster becomes the same as that in the previous repetition ; “as decrements mismatch allowance threshold and starts again (figure 4 element 52)

“(e) means for repeating the operations of means (b) through (d) until given convergence conditions are satisfied; and “ calculates and continually decrements until the commonality is greater than the threshold (0044)

“(f) means for deciding, on the basis of the document (or pattern) commonality of each document (or pattern) to each cluster, a cluster to which each document (or pattern) belongs.” (abstract commonality of documents).

***Allowable Subject Matter***

9. Claims 7 and 9-12 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

10. The prior art made of record listed on PTO-892 and not relied, if any, upon is considered pertinent to applicant's disclosure.

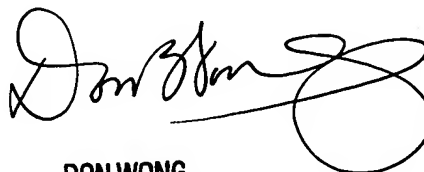
***Contact Information***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael D. Pham whose telephone number is (571)272-3924. The examiner can normally be reached on Monday - Friday 9am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cottingham can be reached on 571-272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael Pham  
Art Unit 2167  
Examiner

A handwritten signature in black ink, appearing to read "Don Wong", with a large, stylized loop at the end.

**DON WONG  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100**